REMARKS

The rejection of Claims 51, 52, and 55, under §102(b) as being anticipated by Mills is respectfully traversed. Mills element 48 is non-analogous to drag bit cutting elements. The Mills element 48 is not a drag bit cutting element, but rather a "pilot bit" (see column 5, lines 1-8). Claim 51 has now been amended to define "a replaceable cutting element for use on the body of an earth boring drag bit...". This amended wording now clearly limits the use of the element to a drag bit function which experiences entirely different loadings from that of a conventional rotating bit. The Examiner's statement that pilot cutter 46 of Mills is inherently suitable for drag bit use is incorrect. The obtuse included angle of the tapered structure of applicant's element completely surrounds the tip structure, which is important for the cutting element function. The Mills pilot cutter 46 has two quadrants of the cutter which are cut away (see exhibit A of applicant's August 25, 2003 Amendment). The two cut away quadrants give the cutting edges only a 90° or less included angle for the remaining support structure of the cutter, and therefore, the cutter 46 clearly does not have the strength to sustain the lateral loads a drag bit experiences.

Claim 51 calls for a contact structure being generally conical and surrounding the tip structure with a generally obtuse included angle. The Mills element 46 is missing a two quadrants of structure and clearly does not fully surround flat metal blade 48.

Regarding Claim 55, while Mills cutter 46 does include a point, it does not include the remaining structure in Claim 51 above discussed.

Regarding Claim 56, the Examiner's statement that Mills shows an engagable structure with a non-cylindrical surface in figure 3, applicant disagrees. While the two flat

ends of blade 48 of Mills are non-circular, they are so narrow in width if a wrench was applied to the two surfaces, the wrench would merely rotate off the surfaces due to their very narrow width. For two flat surfaces to respond to a similar flat surfaced wrench they must have sufficient width and it's applicant's contention that there isn't sufficient width of blade portions 48 to be gripped with a tool and rotated.

The Examiner's rejection of Claim 58 under §103(a) as obvious over Mills et al is respectfully traversed for the same reasons stated above regarding Claim 51.

Rejection of Claims 57, 59, and 60 under §103(a) as being unpatentable over Mills in view of Reusser is respectfully traversed, first for the reasons stated regarding Claim 51. Neither Mills nor Reusser or their combined teachings show the use of a conical, helical, screw thread on a drag bit element. The Reusser structure is a joint between two sections of well casing that sustains high tensile axial loading. A cutting element, such as applicants, sustains lateral loading and if the loading is on the correct side of the element, it will attempt to unscrew the element from its threaded joint. While loads upon the opposite side of the element would tend to tighten the element. Drag elements experience entirely different loadings than the axial loadings of the Reusser reference.

The reasons for use of the tapered helical screw thread in well casing and tubing, such as Reusser, is entirely different. Reusser is attempting to achieve maximum joint strength, sealing capabilities, and ease of assembly. If the tubing is used for drilling the well, the joint must be able to withstand high torque loads in addition to tensile loads. Applicant utilizes the conical helical screw thread to achieve minimal spacing of the elements in the bit body, as shown in Figure 13 and 14, and also the concept of a no tolerance thread fit once the element is tightened in place. These last mentioned uses of

applicant's conical helical screw thread are clearly not taught in Reusser or any of the other references of record. Claim 59 also calls for the replaceable element to be mounted on the body of an earth boring drag bit, off center from the axis of rotation, which as argued above is entirely different as to the loading on the Mills pilot cutter 46. The tapered helical screw thread on applicant's elements permits closer spacing and a larger number of elements to be located on the bit body 146 thereby decreasing the load on the individual elements and increasing the wear life.

Applicant's use of a tapered helical thread to mount drag elements in the body of a drag bit is clearly unique for reasons stated above and is not shown or anticipated by Reusser. The only reference showing a tapered helical thread is that of Tibbitts 245. To be "self locking" Tibbitts requires a locking key 338 in Figure 18, which apparently means Tibbitts feels that the element 320 could work itself out, which supports the argument that it is not obvious to use a tapered thread alone to self lock.

The rejection of Claim 53 under §103(a) as being unpatentable over Mills in view of Evans is also traversed for the reasons stated above regarding Claim 51 from which Claim 53 depends.

Both Claims of 51 and 61 defined a cutting element mounted on the body of an earth boring drag bit off center from the axis of rotation of the bit which Mills clearly does not teach or anticipate.

Claim 61 has been amended to more clearly define a "cutting tapered structure" which "fully surrounds and supports" the "first material of wear resistance" which none of the prior art teach.

Claims 59 and 60 clearly define a self locking replaceable element with conical helical screw thread for mounting the cutting element off center from the axis of rotation of a drag bit which is not taught by Tibbitts or any of the prior art of record.

Claim 54 which was indicated as allowable, has been incorporated into independent Claims 51 and 61 which now appear to be allowable as would all dependent Claims on those Claims.

Application appears to be in condition for allowance.

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